ASSIGNMENT 5

Textbook Assignment: "Electrical and Electronic Circuit Analysis," chapter 5, pages 5-1 through 5-87.

5-1. What is the function of the gun mount/GMLS control circuits?

1. To control the sequence of operation
2. To control the application of power drives only
3. To act as a safety interlock for safe operation only
4. To provide a means of controlling the operation of the gun-loading and launcher-handling systems only

5-2. What is the normal source of gun mount/launcher control circuit voltage?

1. The ship's 115-volt power supply
2. The ship's 400-cycle generators
3. A transformer in the fire control switchboard
4. A gun mount/launcher transformer

5-3. What is the latest schematic designation for an indicator light?

1. L
2. LI
3. DS
4. DL

5-4. How are electrical fuses rated?

1. In ohms, by the resistance they provide the system
2. In amperes, by the current they can carry safely
3. In volts, by the voltage they can carry safely
4. In microfarads, by the impedance they can produce safely

5-5. What is the latest standard schematic designation for a fuse?

1. F
2. FA
3. FE
4. FZ

5-6. Why do electrical switches normally operate with a snap action?

1. To increase response time
2. To minimize arcing
3. To streamline operation
4. To ensure a good low-resistance connection

5-7. The number of switch contacts operated by a single rotary switch should be changed by using what method?

1. By replacing the switch with a larger or smaller version
2. By adding or subtracting switch layers
3. By wiring the contacts in series
4. By adding a canned relay

5-8. What device ensures the proper alignment of switch contacts in a JR switch?

1. A stenciled plate with alignment marks
2. A spring lock inside each contact
3. A detente wheel
4. A spring-loaded lockpin attached to the center shaft

5-9. The movement of a JR switch is limited by what action?

1. By inserting pins in the top deck
2. By stops attached to the face of the unit where the switch is installed
3. By stops installed at the factory
4. By the operator; no positive stops are possible

5-10. What device is used to actuate a proximity switch?

1. An infrared light beam
2. A magnet attached to a stationary component
3. A magnet attached to a moving component
4. A UV light beam

5-11. What determines the delay interval of a time-delay relay?

1. The size of the in-line resistor
2. The number of core laminations
3. The thickness of the copper sleeve around the core
4. The size of the adjustable orifice

5-12. What total number of sets of contacts are contained in a miniature canned relay?

1. Six
2. Two
3. Three
4. Four

5-13. What designation describes the normally closed contacts of a miniature canned relay?

1. NC
2. HF
3. HB
4. CC

5-14. What is the function of the D contact of a motor contactor?

1. To supply power to the drive motor
2. To indicate when the contactor is closed
3. To energize the contactor inertia lock
4. To provide a ground for the contactor body

5-15. What factor determines the delay time for the actuation of an overload relay?

1. The size of the adjustable air orifice
2. The magnitude of the overload
3. The viscosity of the oil in the dashpot
4. The size of the in-line delay resistor

5-16. What is the function of the dashpot in an overload relay?

1. To cushion the contact plunger as it reaches the end of its travel
2. To delay operation of the relay
3. To delay closing of the relay after the system has been reset
4. To transfer heat away from the overheated contacts

5-17. Circuit breakers perform what function?

1. Overload protection only
2. Automatic power source transfer only
3. Overload protection and switching only
4. Overload protection, automatic power source transfer, and switching

5-18. What is the function of the pilot valve in the new type of solenoid housing used on the Mk 45 gun system?

1. To act as a detente
2. To control the flow of hydraulic fluid to system operating pistons
3. To direct hydraulic fluid flow to the desired solenoid actuating piston where it is directed to a valve block
4. To act as a flow control check valve that allows fluid flow in only one direction

5-19. Solenoids convert electrical inputs into what kind of output?

1. Electrical
2. Hydraulic
3. Manual
4. Mechanical

5-20. What is the primary function of solenoids in weapon systems?

1. To act as the primary link between the electrical control system and the hydraulic system
2. To shift the solenoid back to neutral after it is de-energized
3. To provide equipment position feedback to the control system
4. To energize LC3

5-21. Which of the following capabilities is NOT an advantage of the new type of solenoid housing used on the Mk 45 gun system?

1. It can be removed and replaced by removing four bolts
2. It requires fewer hydraulic seals
3. It is easier to adjust
4. It incorporates the hydraulic control valve

5-22. How should you determine the meaning of a nonstandard electrical symbol used in a gun system schematic drawing?

1. Contact the manufacturer
2. Refer to the system OP
3. Refer to ANSI Y32.2-1975
4. Contact NAVSEA

5-23. Which of the following designations identifies an interlock switch in the empty case ejector circuit of a Mk 45 gun mount?

1. SWSl
2. SIS1
3. SIMl
4. QASi

5-24. What train system component is identified by the Mk 45 gun mount designation KTTl?

1. A control relay
2. A time delay relay
3. A circuit breaker
4. A contactor

5-25. How are transistors used in the control circuits of modern gun mounts?

1. As control relays
2. As interlock relays
3. As electronic switches
4. As current amplifiers

5-26. What is the difference between the schematic symbols of a PNP and an NPN transistor?

1. The arrow on the emitter of the PNP points away from the base, while the NPN arrow points toward the base
2. The arrow on the collector of the PNP points toward the base, while the NPN arrow points away from the base
3. The arrow on the collector of the PNP points away from the base, while the NPN arrow points toward the base
4. The arrow on the emitter of the PNP points toward the base, while the NPN arrow points away from the base

5-27. What condition causes an NPN transistor to conduct?

1. When the electrical potential on the base is HIGH in relation to the potential on the emitter
2. When the electrical potential on the base is LOW in relation to the potential on the emitter
3. When the electrical potential on the base is HIGH in relation to the potential on the collector
4. When the electrical potential on the base is LOW in relation to the potential on the collector

5-28. What is the first step in troubleshooting electronic control circuit problems?

1. Determine if the problem is in the 115-volt or 24-volt circuits
2. Verify the operation of the output transistor
3. Check the output of the output transistor
4. Determine where in the operational sequence the equipment stopped

5-29. What action should you take before removing a circuit board from an electrical panel?

1. Attach a grounding strap to the circuit card
2. Attach a grounding strap to your wrist
3. Secure the power
4. Get permission from the weapons officer

5-30. Which of the following circuits or situations defines how logic circuits function?

1. A blown fuse in a 115-volt power supply circuit
2. A transistorized circuit
3. A solenoid circuit
4. A meter reading of infinite ohms

5-31. What inputs are required (using LOW logic) for the output of an AND gate to be HIGH?

1. All the inputs to be LOW
2. All the inputs to be HIGH
3. Any one of the inputs to be HIGH
4. Any one of the inputs to be LOW

5-32. What inputs are required (using LOW logic) for the output of an OR gate to be LOW?

1. All the inputs to be LOW
2. All the inputs to be HIGH
3. Any one of the inputs to be HIGH
4. Any one of the inputs to be LOW

5-33. What is the function of the microprocessor in a 5”/54 Mk 45 Mod 1 gun mount?

1. To monitor the operational sequence of the gun
2. To turn gun orders into train and elevation orders
3. To amplify gun orders only
4. To amplify gun and fuze setter orders

5-34. What is the function of a circuit card extender?

1. It adapts the circuit card to the system test slot
2. It allows readings to be taken on a card while the system is energized
3. It provides test points for some of the pin connections on the card
4. It performs a diagnostic test of the cards function

5-35. What is the function of a synchro?

1. To compute and generate gun orders
2. To transmit data
3. To interpret data
4. To modulate data

5-36. What is a primary applications of synchros in a gun or GMLS system?

1. Loading system control
2. Control voltage generation
3. Power drive control
4. Control system diagnosis

5-37. Which of the following qualities makes synchros useful for controlling naval weapons?

1. Accuracy only
2. Power only
3. Accuracy and power
4. Accuracy and speed

5-38. What are the three classes of synchros?

1. Differential, receiver, and transmitter
2. Transmitter, receiver, and control transformer
3. Torque transmitter, differential, and control transformer
4. Torque transmitter, control transmitter, and receiver

5-39. What is/are the function(s) of a synchro differential?

1. To add two signals and transmit the results only
2. To add or subtract two inputs and to transmit the results to another synchro to supply a mechanical output
3. To position a mechanical device such as a dial only
4. To add or subtract two inputs and position a dial with the results

5-40. What device(s) is/are used in a servo system that requires electrical outputs?

1. TX and CX
2. TX only
3. CT
4. CX and TR

5-41. Which of the following terms defines the electrical reference point of a synchro?

1. Rotor position
2. Electrical zero
3. Rotor zero
4. Electrical reference

5-42. What is the basic principle of synchro system operation?

1. The stator of the receiver matches the rotor position of the transmitter
2. The rotor of the transmitter matches the rotor position of the receiver
3. The rotor of the receiver matches the rotor position of the transmitter
4. The stator of the receiver matches the stator position of the transmitter

5-43. It is not necessary for the electrical and mechanical reference points of a gun system to be aligned.

1. True
2. False

5-44. What action must be taken before you replace a synchro using the electrical zero method?

1. Position all equipment to mechanical zero using a tram bar, slip all indicator dials to read perfect zero, then replace the synchro
2. Position all equipment and indicators at zero, set all synchros at electrical zero, then replace the synchro
3. Set all dials at zero without regard to equipment position, electrically zero all synchros, then replace the synchro
4. Disconnect and electrically zero all system synchros, then remove and replace the synchro, and reconnect all synchros

5-45. Which of the following problems is an indication of a malfunctioning synchro transmitter?

1. One receiver fails to read correctly only
2. All receivers fails to read correctly
3. The receiver rotor locks at 180 degrees
4. The receiver rotor locks at 120 degrees

5-46. Which of the following factors is NOT a cause of open circuits?

1. Vibration
2. Faulty installation
3. Clean or tight connections
4. Dirty or loose connections

5-47. Which of the following terms describes a low-resistance path for current flow that bypasses the intended load of a circuit?

1. An open
2. A short
3. A ground
4. A hot ground

5-48. What is the purpose of the gun control panel (GCP) in the Mk 75 gun mount control system?

1. It provides the intermediate link between the fire control system and the gun mount
2. It provides for barrel cooling
3. It provides air conditioning and heating in the ammo handling room
4. It provides sprinkler protection for the ammo handling room

5-49. The inner surface of the gun port shield comes equipped with what total number of heating elements?

1. Nine
2. Eight
3. Seven
4. Six

5-50. What Mk 75 assembly allows for unlimited training of the gun mount?

1. Slip ring
2. Barrel cooling
3. Heating element
4. Ventilation

5-51. Which of the following systems is NOT an auxiliary system on the Mk 75 gun mount?

1. Lighting
2. Loading
3. Telephone
4. Ventilation

5-52. Train movement is possible to what total number of degrees on the Mk 75 gun mount?

1. 720 degrees
2. 540 degrees
3. 360 degrees
4. Unlimited

5-53. The train system on the Mk 75 is powered by what total number of electrical motors?

1. One
2. Two
3. Three
4. Four

5-54. The train motor cannot be energized with the training handcrank in place.

1. True
2. False

5-55. What device drives the firing cutout camstack assembly on the Mk 75 gun mount?

1. The synchro gearing in the bottom of the train synchro control box
2. The synchro gearing in the bottom of the elevation power drive
3. The receiver regulator gearing
4. The train motor

5-56. The Mk 75 gun mount train and elevation systems use different power supplies.

1. True
2. False

5-57. What device regulates the polarity and amplitude of the current supplied to the train and elevation motors?

1. GCP
2. Motor control system
3. Silicon-controlled rectifiers
4. Demodulator circuits

5-58. The Mk 45 gun mount control system controls which of the following components?

1. Gun laying only
2. Gun loading only
3. Gun laying and gun loading
4. FCS interface

5-59. What is the purpose of the Mk 45 gun mount EPl panel and where is it located?

1. It distributes power to the control components and is located in the gun pocket
2. It distributes hydraulic fluid power and is located in the loader room
3. It distributes power to the control components and is located in the loader room
4. It distributes power to the control components and is located in the magazine

5-60. What is the purpose of the Mk 45 gun mount EP2 panel and where is it located?

1. It controls the gun mount in remote control and is located in the gun pocket
2. It controls the gun mount operations and provides a means for testing and exercising the gun-laying and gun-loading systems and is located in the loader room
3. It controls the gun mount hydraulic system and is located in the magazine
4. It controls the gun mount operations and provides a means for testing and exercising the gun-laying and gun-loading systems and is located in CIC

5-61. The MK 45 gun mount EP3 panel is located in what area?

1. The loader room
2. The magazine
3. The gun pocket
4. The passageway adjacent to the gun mount

5-62. What device, if any, prevents the Mk 45 EPl panel door from being opened when normal or alternate 440-VAC is applied to the panel?

1. The hasp and lock
2. The mount captain
3. A solenoid door latch
4. None

5-63. The train and elevation local control unit is in what location on the Mk 45 gun mount?

1. On top of the EPl panel
2. In the gun mount pocket
3. In CIC
4. On top of the EP2 panel

5-64. The ship's 400-Hertz power is used for which of the following in weapons systems?

1. Power drives
2. Loading and power drives
3. Synchros, fuze setters, and sights
4. Elevators

5-65. When working with electrical circuits, in addition to tagging out the circuit you are working on, what else must you do to ensure your safety?

1. Have a second person stand by the tagged out switch
2. Remove any fuses protecting the circuit you are working on
3. Disconnect the power cables to the unit you are working on
4. Tag out several switches in the circuit providing power to the unit you are working on

5-66. At what minimum intensity may electric current cause death?

1. 1.0 amp
2. 0.5 amp
3. 0.25 amp
4. 0.1 amp

5-67. What is the normal position of the retractable rail on the Mk 13 Mod 4?

1. Extended
2. Neutral
3. Retracted
4. Stow

5-68. On the Mk 13 Mod 4, what factor causes the rail to start its retract cycle after a missile firing?

1. Missile control circuits
2. Forward missile shoe
3. Missile tail-control surface
4. Missile rocket motor

5-69. On the Mk 13 Mod 4, what device(s) cause(s) the rail to start its retract cycle during dud jettison, step load, or exercise operations?

1. Solid-state interlocks energizing the retract launcher rail solenoid LHLl-LC3
2. Solid-state interlocks energizing the retract launcher rail solenoid LHLl-LC4
3. Solid-state interlocks energizing the retract launcher rail solenoid LHLl-LCl
4. The forward missile shoe

5-70. On the Mk 13 Mod 4, the launcher rail automatically extends following missile firing or jettisoning operations.

1. True
2. False